ORDER

6000.45

PROJECT IMPLEMENTATION PLAN FOR THE
AUTOMATED LINE TEST EQUIPMENT (ALTE)

January 6, 1993

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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Initiated By: ASM-310

RECORD OF CHANGES

DIRECTIVE NO. 6000.45

CHANGE TO BASIC	SUPPLEMENT			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FAA Form 1320-5 (6-80) USE PREVIOUS EDITION

FOREWORD

This order promulgates the project implementation plan (PIP) for the automated line test equipment (ALTE) program and provides guidance and direction for the implementation and installation of ALTE. This order provides technical guidance and management direction and assigns responsibilities in the implementation of the ALTE program. It also identifies and describes specific events and activities to be accomplished in order to implement the ALTE.

Joaquin Archilla
Deputy Director, Systems Maintenance Service

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CHAPTER 1. GENERAL

1. PURPOSE. This project implementation plan (PIP) provides technical guidance and management direction for organizations involved in the implementation of the automated line test equipment (ALTE) project.

2. DISTRIBUTION. This order is distributed to the branch level in the Systems Maintenance Service, the NAS Transition and Implementation Service, the Operational Support Service, and the Office of the Associate Administrator for Contracting and Quality Assurance; to the division level at the FAA Technical Center, the FAA Academy, and the FAA Logistics Center; to the branch level in the regional Airway Facilities divisions; and to the Airway Facilities sectors, sector field offices, sector field units, and sector field office units with a limited distribution.

3. ACRONYMS. Refer to Appendix 1, Acronyms, for the acronyms used in this order.

4. APPLICABILITY. The guidance contained herein shall be used by Federal Aviation Administration (FAA) offices, services, regions, and the Aeronautical Center in support of ALTE implementation activities. The guidance and schedule information contained herein shall form the framework for these organizations in the more detailed planning activities required at regional and field levels.

5.-19. RESERVED.

CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS. The ALTE is designed to provide automated telecommunications transmission medium testing. For the large control facilities, the candidate sites for the ALTE are the 23 air route traffic control centers (ARTCC), the FAA Technical Center (FAATC), and the FAA Academy (AMA). At small control facilities, the candidate sites are selected FAA facilities such as the automated flight service stations (AFSS), airport traffic control towers (ATCT), and terminal radar approach control (TRACON) facilities.

21. PURPOSE. The purpose of the ALTE project is to provide a reliable and automated method of performing circuit maintenance checks. This system reduces manpower required for circuit testing and verification; expedites fault isolation within the telecommunications medium by automated test results and documentation; and monitors changes and degradations on circuits.

22. HISTORY.

a. Traditionally, line runs are performed between a remote site and a control site. Technicians located at both ends introduce a series of frequency tones on these circuits and measure the associated transmit and receive parameters. If these tones fall out of the appropriate parameters, the lines are reported to the appropriate telephone company (TELCO) for maintenance.

b. In 1989, the Defense Electronics Commercial Communications Office (DECCO), acting on behalf of the FAA, issued a solicitation for the purchase and installation of ALTE. A fixed price, indefinite delivery/indefinite quantity (ID/IQ) contract was awarded to Hekimian Laboratories, Inc., in March 1990.

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The functional capabilities of the ALTE outlined below represent broad functions that are fulfilled by the equipment.

a. Functional Requirements. The test equipment shall be capable of performing the functions stated below:

(1) Ability to control Ameritec responders, other dual tone multi-frequency devices (DTMF), and signal frequency (SF) loopback devices

(2) Ability to program and monitor results from the existing Hekimian 3701/3901 test products

(3) Ability to perform simultaneous tests up to four circuits

(4) Ability to program tests in any combination

(5) Ability to perform both attended and unattended auto-routine testing of all network trunks and circuits

(6) Ability to allow on-demand testing to isolate trouble when found

b. Tests and Measurements Support Requirements. The following items are tests and measurements that the ALTE must support:

(1) 2-wire or 4-wire transmission

(2) 600 ohms (unit of electrical resistance) for 2-wire circuits

(3) 600/900 ohms for 4-wire circuits

(4) Frequency response

(5) Envelope delay

(6) Return loss

(7) Intermodulation distortion

(8) Voltage

(9) Capacitance

(10) Resistance

(11) Phase jitter

(12) Peak to average ratio (P/AR)

(13) Phase hits

(14) Noise:

(a) Impulse

(b) Balanced

(c) Noise-to-ground

(d) C-message weighted

(e) C-notch

(f) 3 kilohertz (kHz) flat

(g) Signal-to-noise

(15) Gain hits

(16) Drop outs

c. Human Factor Features. The features that contribute to the human factors are:

(1) Ease of selecting line under test

(2) Ease of selecting/initiating specific test to conduct

(3) Clarity of results

31. PHYSICAL DESCRIPTION. The ALTE profile is provided in Appendix 6, Equipment Rack Profile. The basic system elements of the ALTE include hardware and software as listed below.

a. Hardware elements include test access equipment:

(1) Model 3263 metallic test access unit (MTAU) test resource

(2) Models 3701 and 3703 remote communications test systems; models 3705 and 3707 remote pulse code modulation/voice frequency (PCM/VF) communications test system

(3) Models 3901, 3902, and 3910 communications test systems; and Government-furnished equipment (GFE) responder

b. Hardware interface elements include:

(1) Digital Equipment Corporation VT220 alphanumeric video terminal

(2) Combined testing module

(3) Dot matrix printer

c. Software module applications include:

(1) Analog testing support

(2) Combined testing support

(3) Master/slave analog testing

(4) Circuit/access data base

(5) Secondary 64 kilobit per second digital signal and individual channel tests

(6) Full data tests

(7) 100/200-type test line support

(8) Graphics package

(9) Trouble reporting

32. SYSTEM CAPABILITIES. The ALTE provides the following capabilities:

a. Password protection

b. Multi-station remote access

c. Hard copy printout

d. Graphics (printer and display)

e. User-friendly system throughout

f. Site adaptable software

g. Computer-controlled, semi-automated circuit selection

h. Computer-controlled testing

i. Menu and command line software control

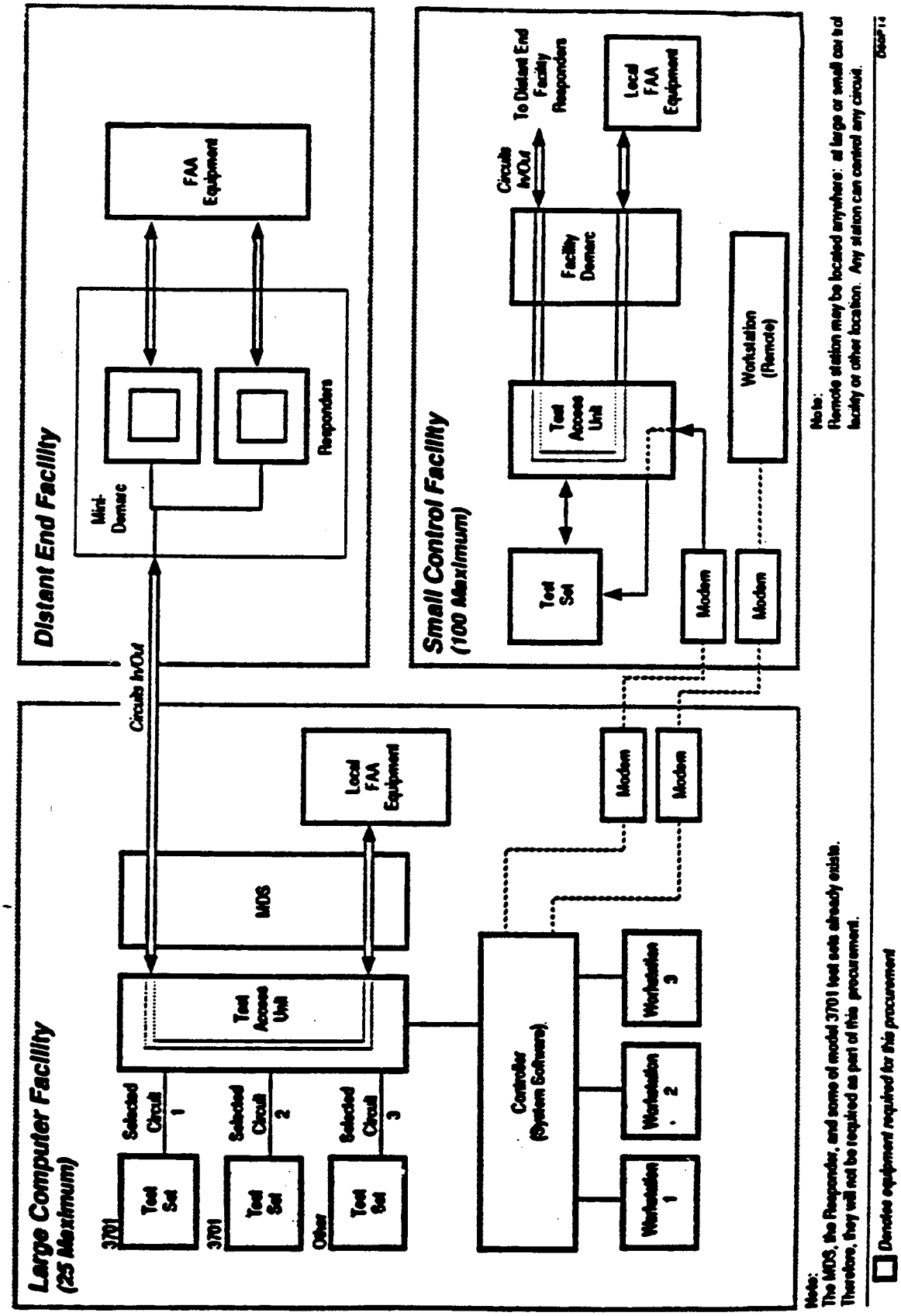
j. Initial system capacity of 400, 4-wire circuits for ARTCC's, with expansion capacity to 1200, 4-wire circuits

k. Full-circuit capacity at up to four work stations

33. INTERFACES. ALTE interfaces with the master demarcation system (MDS) and the mini-telecommunications demarcation system (MTDS). ALTE specific interfaces are shown in Figure 3-1, Automated Test Equipment Concept.

34.-39. RESERVED.

FIGURE 3-1. AUTOMATED TEST EQUIPMENT CONCEPT



CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. Two project activity schedules are provided. Table 4-1, Major Milestones Completed, depicts major milestones that have been completed, the major milestones remaining to complete the project, and their associated dates. Table 4-2.1, Delivery and Installation (Initial), provides a projected delivery and installation schedule for the 20 ARTCC's and five other facilities. Table 4-2.2, Delivery and Installation (Actual), provides the delivery and installation schedule that occurred for the 25 large system facilities. The activities on these tables are by no means inclusive of all milestones required for project completion. The uncompleted milestones are activities dynamic and subject to change.

41. MILESTONE SCHEDULE SUMMARY. The contract award date for the ALTE procurement was March 1990. The deployment readiness review (DRR) process began approximately 120 days after contract award. The DRR provided the process for determining readiness for delivery to the first operational site for commissioning.

42. INTERDEPENDENCIES AND SEQUENCE. The MDS and MTDS projects are directly interrelated with the ALTE project.

43.-49. RESERVED.

TABLE 4-1. MAJOR MILESTONES COMPLETED

ACTIVITY DESCRIPTION	ACTUAL FINISH
Operational capability demonstration (OCD)	02/07/90
Contract awarded	03/22/90
System delivered to first operational site	05/23/90
Initiated DRR process	08/08/90
Shakedown test complete	08/31/90
Physical configuration audit	09/19/90
Prebriefing to AAF-1	10/20/90
DRR executive committee (EXCOM)	10/30/90
Commission of first operational readiness demonstration (ORD) site	11/01/90
Large system delivery initiated	09/28/90
Small system delivery initiated	04/29/91
Large system delivered to last operational site	05/06/91

MAJOR MILESTONES TO BE COMPLETED

ACTIVITY DESCRIPTION	MILESTONE DATE
Small system delivered to last operational site	09/06/93
Complete implementation at last operational site	09/30/93

TABLE 4-2.1 DELIVERY AND INSTALLATION (INITIAL)

DELIVERY SCHEDULE

The ALTE's initial projected delivery dates are listed below:

FACILITY DELIVERY POINT	DELIVERY DATE	COMMISSIONING DATE
Albuquerque, NM		05/90
Boston, MA	11/05/90	12/17/90
Denver, CO	11/12/90	12/10/90
Atlanta, GA	11/17/90	12/17/90
Memphis, TN	11/26/90	01/07/91
Jacksonville, FL	12/03/90	01/14/91
Miami, FL	12/10/90	01/21/91
Minneapolis, MN	12/17/90	01/28/91
Chicago, IL	01/07/91	02/04/91
Cleveland, OH	01/14/91	02/11/91
Indianapolis, IN	01/21/91	02/18/91
Los Angeles, CA	01/28/91	02/25/91
Oakland, CA	02/03/91	03/04/91
Salt Lake City, UT	02/10/91	03/11/91
Seattle, WA	02/17/91	03/18/91
Leesburg, VA	02/24/91	03/25/91
New York, NY	03/04/91	04/01/91
Kansas City (Olathe), KS	03/11/91	04/08/91
Ft. Worth, TX	03/18/91	04/15/91
Houston, TX	03/25/91	04/22/91
Anchorage, AK	04/01/91	05/06/91
Honolulu, HI (CERAP)	05/01/91	06/09/91
San Juan, PR	07/29/91	To Be Determined (TBD)
Technical Center	07/29/91	02/24/92
Academy	07/29/91	02/17/92

One hundred ALTE small control systems were ordered for ATCT's, AFSS's, and TRACON's that are candidate sites submitted by the regional Telecommunications Management and Operations (TM&O) staffs.

TABLE 4-2.2 MILESTONE CHART (ACTUAL)

SITE	SURVEY	SHIP	INSTALLATION START	INSTALLATION COMPLETE	TRAINING START	TRAINING COMPLETE
ALBUQUERQUE		09/30/89	05/11/90	05/18/90	07/30/90	08/03/90
BOSTON	10/29/90	11/26/90	12/10/90	12/17/90	01/28/91	02/03/91
DENVER	11/12/90	11/26/90	05/13/90	05/20/91	06/03/91	06/14/91
CHICAGO	11/19/90	11/26/90	01/21/91	10/18/91	01/06/92	01/15/92
INDIANAPOLIS	11/12/90	11/26/90	05/06/91	05/13/91	12/02/91	12/12/91
OAKLAND	11/26/90	12/17/90	02/17/91	02/24/91	03/03/92	03/12/92
SALT LAKE CITY	11/26/90	12/17/90	01/06/92	01/13/92	01/27/92	02/04/92
SEATTLE	11/26/90	12/17/90	04/29/90	05/03/91	06/11/91	06/21/91
LEESBURG	11/26/90	12/17/90	02/24/91	03/04/91	03/18/91	03/25/91
NEW YORK	12/10/90	12/17/90	02/03/91	02/17/91	03/04/91	03/11/91
KANSAS CITY	12/10/90	12/17/91	04/01/91	04/08/91	04/22/91	04/29/91
FORT WORTH	01/28/91	01/21/91	03/11/91	03/18/91	05/13/91	05/20/91
HOUSTON	01/28/91	01/21/91	03/18/91	03/25/91	06/17/91	06/24/91
HONOLULU	02/17/91	01/21/91	06/17/91	06/21/91	10/21/91	10/31/91
ANCHORAGE	02/17/91	01/21/91	03/25/91	04/01/91	04/08/91	04/15/91
MIAMI	04/22/91	01/21/91	08/26/91	08/30/91	01/21/92	01/30/92
ATLANTA	04/22/91	01/21/91	02/04/92	02/10/92	04/21/92	04/29/92
JACKSONVILLE	04/22/91	01/21/91	11/18/91	11/22/91	06/22/92	07/01/92
MINNEAPOLIS	04/08/91	01/21/91	06/01/92	06/05/92	08/04/92	08/13/92
CLEVELAND	04/08/91	01/21/91	12/07/92	12/11/92	01/11/93	01/15/93
LOS ANGLES	02/10/91	01/21/91	09/09/91	09/13/91	03/17/92	03/25/92
MEMPHIS	10/03/91	07/29/91	12/03/91	12/06/91	07/14/92	07/22/92
FAA ACADEMY	11/20/91	07/29/91	02/10/92	02/17/92	07/30/90	08/03/90
FAA TECH CENTER	05/14/92	07/29/92	03/22/93	03/26/93	TBD	TBD
SAN JUAN, PR	TBD	07/29/91	TBD	TBD	TBD	TBD

CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT, GENERAL. The FAA has designated the Telecommunications Management and Operations (TM&O) Division, ASM-300, as the office of primary responsibility (OPR) for the ALTE project implementation. This organization will accomplish management tasks within the guidelines provided by applicable FAA policies, directives, and procedures.

51. PROJECT MANAGEMENT, RESPONSIBILITIES. The responsibilities within ASM-300 are delegated as follows:

a. ASM-330 is responsible for:

(1) Administering the ALTE contract

(2) Coordinating with DECCO for all contract related issues

(3) Providing installation schedule(s) of the ALTE

(4) Providing guidelines to Hekimian on the equipment quantities for the hardware installation at each site

(5) Reviewing and commenting on the site-survey implementation plans

(6) Coordinating all contract changes, including schedules with contractors

(7) Coordinating transition plans and tests, checkouts, and acceptance procedures

(8) Providing funding for equipment, materials, and any needed site preparation

(9) Conducting periodical contract management review (CMR)

b. The regional AF divisions are responsible for:

(1) Assigning a technical officer's representative (TOR) for implementation, coordination, and support of the project implementation at each affected facility

(2) Reviewing the site-survey installation plan and providing comments to ASM-300

(3) Preparing orders for equipment and issuing through the appropriate region and DECCO

(4) Providing acceptance of site installation

(5) Preparing site requirements

c. The TOR is responsible for:

(1) Arranging for personnel needed during implementation and checkouts

(2) Ensuring the contractor's quality of workmanship and adherence to the statement of work (SOW)

(3) Assisting in on-site resolution of problems encountered during installation and testing

(4) Participating in acceptance testing

(5) Coordinating installation activities with all affected organizations

(6) Conducting and documenting a contractor acceptance inspection (CAI) and joint acceptance inspection (JAI) upon completion of installation

(7) Preparing Department of Defense (DOD) Form DD250, Material Inspection Receiving Report, and signing the acceptance block for the FAA upon completion of installation

NOTE: The TOR does not have the authority to approve changes that affect the contract price, delivery schedule, or end-use requirements of the equipment.

52. PROGRAM MANAGEMENT RESPONSIBILITIES.

a. FAA Program Management. The TM&O staff will interface and work directly with contractors in establishing and accomplishing program goals.

b. CMR. CMR's will be conducted to present a detailed contract status review, track outstanding action items, and provide a forum to highlight activities planned for the next period. Agenda items for the CMR will include:

(1) Contractual issues

(2) Status of project/installation completion

(3) Project schedules

53. PROJECT CONTACTS. Appendix 2, List of ALTE Project Leads, provides a listing of ALTE project leads, and other personnel who are providing those functions required for the implementation of the ALTE system.

54. PROJECT COORDINATION. The following project groups will assist the associate program manager (APM) in fulfilling assigned responsibilities:

a. Support contractors:

(1) Transportation System Center (TSC)

(2) Systems Engineering and Integration Contractor (SEIC)

(3) Aeronautical Radio Incorporated (ARINC), etc.

b. Regional TM&O managers

c. Site/Facility TOR's

55. PROJECT RESPONSIBILITIES. Project responsibilities are listed in the following Table 5-1., Project Responsibilities.

56. PLANNING AND REPORTS.

a. Configuration Control and Status Accounting Reports. These reports provide the information needed for configuration identification and determination of the status of change proposals, deviations, and waivers including the implementation status.

b. Project Progress Reports. These reports notify the Government of the contractor's assessment of contractual effort as of the date of the report, work scheduled for the next period, and special problem areas including proposed solutions.

c. Engineering Field Trip Reports. The contractor shall provide field service engineering support to resolve hardware and firmware problems encountered with on-site implementation of the system.

d. Program Status Review Board (PSRB) Meeting. This meeting provides information on the schedule and technical status of the projects.

57.-59. RESERVED.

TABLE 5-1. PROJECT RESPONSIBILITIES

TASK/PLAN ACTIVITY	RESPONSIBILITY	SUPPORT OFFICE(S)
Prepare project implementation plans	Hekimian Labs	ASM-330
Installation schedule	ASM-330	Regions
Site preparation	Hekimian Labs	ASM-330/ Regions
Prepare telecommunications service requests (TSR's)	Regions	ASM-330
Coordinate installation	TOR	ASM-330/ Regional TM&O Managers
ALTE installation	Hekimian Labs	ASM-300/ Assigned TOR
Transition plans, test and check-out procedures	ASM-330	AOS-240
Prepare national airspace change proposals (NCP's) as needed	ASM-330	ASM-320
Implementation plans	ASM-330	ASM-320
Training	Hekimian Labs	ASM-330
Funding	ASM-300	

CHAPTER 6. PROJECT FUNDING

60. GENERAL. Funding for procurement, installation, regional site preparation, and contractor-performed requirements will be provided by the Washington headquarters leased communications allocation funds from the operations budget.

61. STATUS OF FUNDING. Funding was allocated for 25 locations that included 20 ARTCC's in the Continental United States; the ARTCC's in Honolulu, HI, Anchorage, AK, and San Juan, PR; the FAA Technical Center; and the FAA Academy. Funding for the remaining 100 small facilities was also allocated.

62.-69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. The primary method by which deployment planning is developed is the DRR. The review defines the management process by which the ALTE APM leads an FAA review to ensure that the ALTE program is ready to be integrated into the National Airspace System (NAS) and that the regions are ready to receive the systems when deployed.

71. THE DRR SCHEDULE was as follows:

a.	Initial review	07/17/90
b.	FAA team meeting	07/26/90
c.	Shakedown testing complete	08/31/90
d.	DRR report to AAF-1	10/26/90
e.	DRR EXCOM meeting	10/30/90
f.	Commission first ORD	11/01/90

72. The DRR team responsibilities and goals were accomplished with the commissioning of Albuquerque, NM ARTCC in May 1990.

73. SITE PREPARATION.

a. Regional Points of Contact. The ALTE contractor will establish contact with the regional TM&O manager in order to determine the point of contact for the site receiving the ALTE. The ALTE contractor will conduct a site survey and coordinate all installation activities with the FAA APM and designated field representatives. All site preparation will be performed by FAA personnel.

b. Building Access. Upon arrival at a site, the contractor shall notify the appropriate FAA personnel of their arrival. Unless prohibited, the FAA will allow ALTE maintenance contractor personnel, with proper identification, unescorted access to the ALTE sites. The contractor shall be responsible for the security of keys, combinations, or other methods issued for access to an FAA facility or equipment.

74. DELIVERY. The contractor is responsible for all activities relating to packing, shipping, receiving, installing, integrating, and testing all elements of the ALTE. All items specified by the contract are to be delivered to each site by the contractor to permit testing and acceptance in accordance with plans developed prior to deployment. Delivered items include hardware components, computer program tapes, manuals, and other documents. The actual delivery schedule for large facilities such as ARTCC's is shown in Table 4-2.2. The delivery schedule for small facilities will be provided in an additional table at a later date.

75.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. GENERAL. Verification of the technical contract requirement (TCR) will be accomplished by a series of test and evaluation activities at the contractor's site and at each installation. After completion of factory testing, the equipment will be packaged, crated, and shipped to sites for installation and site-acceptance testing. At the completion of on-site testing, the FAA site TOR will accept the system and begin the necessary activities for full utilization.

81. CHECKOUTS. After site installation, the contractor will perform the first stage of on-site testing checkout at the intra-system level. The ALTE tests verify hardware integrity prior to interfacing with any site equipment. The tests consist mainly of system alignment, internal processor tests, input/output device testing, voltage and signal tests, cable testing, and major functional tests.

82. CONTRACTOR INTEGRATION AND ACCEPTANCE TESTING.

a. Following the successful completion of intra-system checkouts, testing of the integrated equipment will be performed. The contractor will perform system tests using load boxes and other suitable devices to ensure that normal FAA operational functions are not disturbed. All operational software for the system will be loaded and the site adaptation exercise will be run. All input/output devices will be exercised and tested for proper system operation. These tests shall be completed to the Government's satisfaction. The Government's representative will witness all tests or perform on-site load testing.

b. Upon completion of the CAI testing, the contractor JAI will be conducted. Successful completion of CAI signifies the formal acceptance by the FAA of the ALTE equipment from the contractor.

83. ACCEPTANCE AND INTEGRATION TESTING DOCUMENTATION. A site specific acceptance and integration testing book will be provided by the contractor for each site during installation.

84.-89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. ALTE MAINTENANCE CONCEPT. The contractor will develop and conduct an integrated logistics support (ILS) program [contract data requirements list (CDRL) F04]. The FAA program offices (AOS-600, AML-1, and various regions) will review CDRL F04 before acceptance. The site administrator will be designated by each ARTCC facility. The contractor will support each site with all maintenance resources, test equipment, and trained technical personnel to troubleshoot and repair the system for the first year warranty period, with four options of 1 year each as required. The contractor will provide two levels of maintenance: site and depot. Site maintenance consists of preventive maintenance and corrective maintenance actions. The depot maintenance provides for depot-level repair of faulty line replaceable units through the life of the contract. The contractor will also concurrently provide additional maintenance services, including scheduled telephone availability, contractor maintenance support, and emergency site service. The site administrator designated at each ARTCC facility will be the point of contact for contractor maintenance support. Regions will monitor contractor maintenance performance and provide this information to the program offices. FAA Form 256, Inspection Report of Material and/or Services, should be used by the regions. Formal training on the ALTE will be provided by the contractor to FAA technicians.

a. Scheduled telephone availability maintenance service. The contractor will provide telephone advisory service during normal duty hours. This service will be staffed by contractor ALTE maintenance experts who are fully prepared and equipped to provide guidance to FAA technicians when they are unable to identify or resolve an ALTE problem.

b. Contractor maintenance support. A contractor maintenance technician will provide telephonic assistance within two hours after notification by the Government. The contractor will ensure availability of qualified personnel to restore failed equipment on-site if requested by the facility.

c. Emergency site service. The contractor will, upon request, provide emergency site service by a fully qualified ALTE technician. Equipment failures will be restored within seven days of notification of a maintenance problem.

91. TRAINING. The contractor will develop maintenance training in accordance with the requirements. The contractor-provided training on the large system will be conducted at each specific site following installation. To initiate small site installation and training, regions or the designated TOR will supply the number of lines per site plus personnel to be trained. Classes will be structured with course objectives, lectures, and hands-on training. FAA Academy personnel will develop the training course necessary for attrition training.

92. CONFIGURATION MANAGEMENT (CM).

a. CM is applied to NAS design levels, as well as to all elements of a system, including hardware, software, firmware, test equipment, facilities, and documentation (specifications, plans, drawings, manuals, etc.). The latest version of Order 1800.8, NAS Configuration Management, provides detailed guidance on how CM is to be accomplished.

b. CM is a discipline applying technical and administrative direction and surveillance to:

(1) Identify and document the functional and physical characteristics of a configuration item

(2) Control changes to those characteristics

(3) Record and report change processing and implementation status

(4) Audit documentation to ensure adequacy of the established baseline

c. These basic elements are defined as follows:

(1) Configuration identification consists of the currently approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings, and associated lists and documents referenced therein.

(2) Configuration control is the systematic evaluation, coordination, approval or disapproval, and implementation of all approved changes in the configuration of an item after formal establishment of it as a configuration item.

(3) Configuration status accounting records and reports is the information needed to manage the configuration effectively. This includes a listing of the approved configuration identification, the status of the proposed changes to the configuration, and the implementation status of approved changes.

(4) Configuration auditing is the formal examination of the configuration identification and the configuration items to ensure product integrity prior to establishing a baseline for a configuration time.

93.-99. RESERVED.

APPENDIX 1. ACRONYMS

AF	Airway Facilities
AFSS	Automated Flight Service Station
ALTE	Automated Line Test Equipment
AMA	FAA Academy at the Aeronautical Center
APM	Associate Program Manager
ARINC	Aeronautical Radio Incorporated
ARTCC	Air Route Traffic Control Center
AT	Air Traffic
ATCT	Airport Traffic Control Tower
BUEC	Backup Emergency Communications
BUS	Data Bus
CAI	Contractor Acceptance Inspection
CDRL	Contract Data Requirements List
CERAP	Combined Center/Radar Approach Control (RAPCON)
CM	Configuration Management
CMR	Contract Management Review
CTS	Coded Time Source
DATAMUX	Data Multiplexor
DECCO	Defense Electronics Commercial Communications Office
DOD	Department of Defense
DRR	Deployment Readiness Review
DTMF	Dual Tone Multi-Frequency
EXCOM	Executive Committee
FAA	Federal Aviation Administration
FAATC	FAA Technical Center
GFE	Government-Furnished Equipment
ID/IQ	Indefinite Delivery/Indefinite Quantity
ILS	Integrated Logistics Support
I/O	Input/Output
JAI	Joint Acceptance Inspection
kHz	Kilohertz
MDS	Master Demarcation System
MISC	Miscellaneous
MTAU	Metallic Test and Access Unit
MTDS	Mini-Telecommunications Demarcation System

APPENDIX 1. ACRONYMS (CONTINUED)

NADIN	National Automated Data Interchange Network
NAS	National Airspace System
NCP	NAS Change Proposal
NOM	NAS Operations Managers
OCD	Operational Capability Demonstration
ohms	Unit of Electrical Resistance
OPR	Office of Primary Responsibility
ORD	Operational Readiness Demonstration
P/AR	Peak to Average Ratio
PCM/VF	Pulse Code Modulation/Voice Frequency
PIP	Project Implementation Plan
PSRB	Program Status Review Board
RCAG	Remote Center Air/Ground Communication Facility
RCL	Radio Communications Link
R&D	Research and Development
REACT	Remote Access and Test System
SEIC	Systems Engineering and Integration Contractor
SF	Signal Frequency
SOW	Statement of Work
TBD	To Be Determined
TCR	Technical Contract Requirement
TELCO	Telephone Company
TM&O	Telecommunications Management and Operations
TOR	Technical Officer's Representative
TRACON	Terminal Radar Approach Control
TSC	Transportation System Center
TSR	Telecommunications Service Request
VAX	Virtual Address Extension
WX	Weather

APPENDIX 2. LIST OF ALTE PROJECT LEADS

HEADQUARTERS	NAMES/TITLES	PHONE NUMBERS
ASM-300	David Tuttle TM&O Division Manager	202-267-8225
ASM-330	Michael Kavanaugh ALTE Associate Program Manager	202-267-3061

REGIONS	NAMES/TITLES	PHONE NUMBERS
Alaskan	Jerry Gilley TM&O Manager, AAL-482	907-271-3734
Central	Eric Wood TM&O Manager, ACE-428	913-791-8680
Eastern	Nelson Valerio TM&O Manager, AEA-482	718-712-8465
Great Lakes	Zenny Mereckis TM&O Manager, AGL-482	312-694-7721
New England	Steve Wojcicki TM&O Manager, ANE-480	617-273-7177
Northwest Mountain	Sam Sullivan TM&O Supervisor, ANM-428B	206-227-2419
Southern	Richard Rarick TM&O Manager, ASO-482	404-763-7932
Southwest	Mike Johanson TM&O Manager, ASW-482	817-740-3396
Western-Pacific	Steve Tanji TM&O Manager, AWP-481	310-643-3201

APPENDIX 3. ALTE SITE INTEGRATION PLAN

1. PURPOSE. This plan is for the integration of the ALTE system to an active MDS frame. Because of the critical need for communications, a safe method of integration should be used. The goal is to integrate the new system to the operational MDS frame without any interruptions to air traffic service. Setting an exact time for the completion of the ALTE integration is difficult. But as more knowledge of the system is gained, integration is expected to proceed at a faster pace. Since this system has the ability to gain access to any circuit on the MDS frame, a password protection plan should be implemented before the integration procedure begins.

2. REFERENCES. The following documents and training manuals will be used for guidance in the building of the circuit data base, system users, and security of the system.

a. REACT 2000 Network Management System User's Manual, Volume 1

b. REACT 2000 Network Management System User's Manual, Volume 2

c. Hekimian training materials

3. APPLICATION. This integration plan applies to ARTCC's MDS and Hekimian ALTE systems.

4. MATERIALS.

a. Type-66 blocks with two 25-pair connectors or Type-110 blocks with amphenol connectors.

b. Hekimian 3701 communication test system.

5. INTEGRATION PROCEDURE.

a. Prior to the actual connection to the MDS frame, ALTE should be checked for hardware and software defects. Ensure that the circuits entered into the data base are correct. Each connection to the MDS block carries 24 circuits; therefore, the connection should be performed during hours that would least affect air traffic.

APPENDIX 3. ALTE SITE INTEGRATION PLAN (CONTINUED)

b. Integration to the MDS shall be carried out one block at a time, each block carrying with it a maximum of 24 circuits. There should not be any interruption to service except during a line test of an individual circuit, at which point a release shall be obtained. These blocks shall be worked on during hours that will least affect air traffic. The following is a list of blocks in order of integration.

SERVICE		MDS FRAME	MDS BLOCK
1.	MISC	6	13
2.	WX	1	7
3.	BUEC	3	5
4.	BUEC	3	6
5.	NADIN	2	6
6.	DATAMUX	3	7
7.	DATAMUX	3	8
8.	RCAG	4	5
9.	RCAG	4	6
10.	RCAG	4	7
11.	T1/RCL	1	5
12.	T1/RCL	1	6
13.	300	To be installed as required.	

c. System Integration Implementation.

(1) Enter all circuits on the MDS frame into the ALTE data base.

(2) Connect Type-66 block to ALTE's line-side transmit to receive (see ALTE to MDS cross-connect table).

(3) Send a 1 kHz tone out of each circuit one at a time, and check to see if it appears at the 66 block in the proper location as related to the MDS block. With bridge clips connected, check to see if the ALTE receives the tone (repeat steps in this appendix, paragraphs 5. b. & c. (above) for all MDS blocks).

(4) With the approval of air traffic (AT), plug the required connectors into one designated MDS frame and block at a time (supply the NAS operations manager (NOM) (formerly Systems Engineers' (SE) positions) with a list of circuits on the block).

(5) Obtain a release on the circuits one at a time and cut the straps on the MDS block. Run circuit tests using the ALTE and its available responders in accordance with FAA Order 6000.22, Percentage Maintenance of Two-Point Private Lines.

APPENDIX 4. ALTE TO MDS CROSS-CONNECT EXAMPLE

NOTE: The following example is the cross-connect plan provided by the New England region for the Boston ARTCC.

JACKS	RELAY	SHELF	MDS FRAME	MDS BLOCK	SERVICE
J1 - J4	1- 25	4A	4	5	RCAG
J5 - J8	1- 25	4C	4	6	RCAG
J9 -J12	26- 50	4A	4	7	RCAG
J13 -J16	26- 50	4C	6	13	MISC

JACKS	RELAY	SHELF	FRAME	BLOCK	SERVICE
J1 - J4	1- 25	4A	3	7	DATAMUX
J5 - J8	1- 25	4C	3	8	DATAMUX
J9 -J12	26- 50	4A	2	6	NADIN
J13 -J16	26- 50	4C	1	7	WX

JACKS	RELAY	SHELF	FRAME	BLOCK	SERVICE
J1 - J4	1- 25	4A	3	5	BUEC
J5 - J8	1- 25	4C	3	6	BUEC
J9 -J12	26- 50	4A	3	13	300
J13 -J16	26- 50	4C	3	14	300

JACKS	RELAY	SHELF	FRAME	BLOCK	SERVICE
J1 - J4	1- 25	4A	3	15	300
J5 - J8	1- 25	4C	3	16	300
J9 -J12	26- 50	4A	4	13	300
J13 -J16	26- 50	4C	4	14	300

JACKS	RELAY	SHELF	FRAME	BLOCK	SERVICE
J1 - J4	1- 25	4A	4	15	300
J5 - J8	1- 25	4C	4	16	300
J9 -J12	26- 50	4A	1	5	T1/RCL
J13 -J16	26- 50	4C	1	6	T1/RCL

NOTE: ALTA jack assignments to the MDS block are as shown. Smaller numbers are TX, larger numbers are RX.

LINE	MDS
TX J1	J11
RX J3	J2
TX J5	J11
RX J7	J2
TX J9	J11
RX J11	J2
TX J13	J11
RX J15	J2

JACK FIELD & EQUIP	MDS
J2	J10
J4	J3
J6	J10
J8	J3
J10	J10
J12	J3
J14	J10
J16	J3

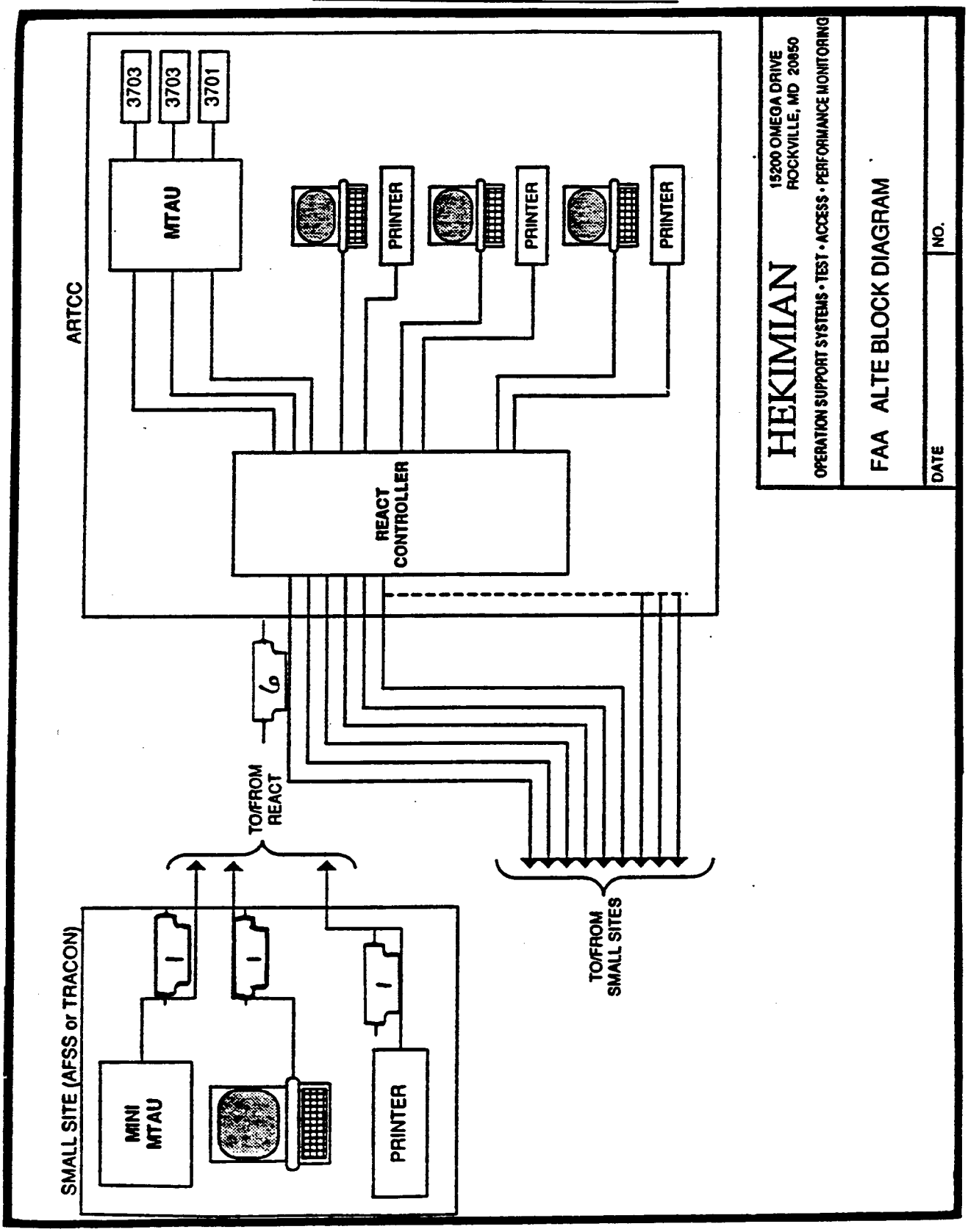
APPENDIX 5. ALTE MODEM CONFIGURATION

1. CONFIGURATION. Figure 5-1., ALTE Modem Configuration-(ALTE Block Diagram), is a modem configuration layout showing the inbound modems, outbound modems, and the virtual address extension (VAX) system. For an AFSS to run a test on their circuits, an inbound modem is needed on which the technician may call in from his/her terminal. The outbound modem is required by the VAX to call out to the MTAU at the remote site. Therefore, three modems and three phone lines are required (for circuit testing) for each small terminal. If a fourth AFSS wants to run circuit tests, they would have to wait for the next available modem port.

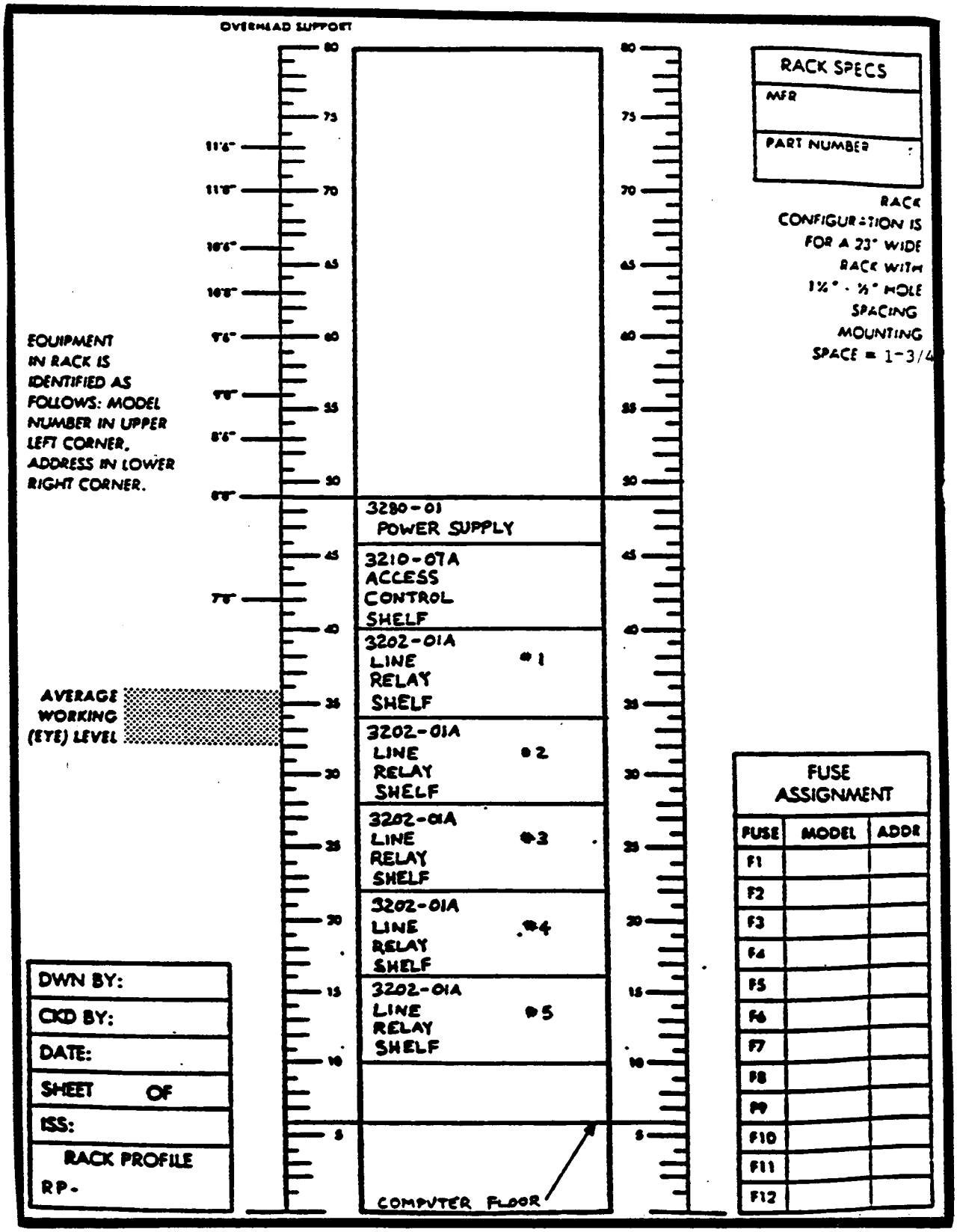
2. SYSTEM SECURITY. The ARTCC's system administrator will assign passwords for small terminal access to the Remote Access and Test (REACT 2000) system.

APPENDIX 5. ALTE MODEM CONFIGURATION (CONTINUED)

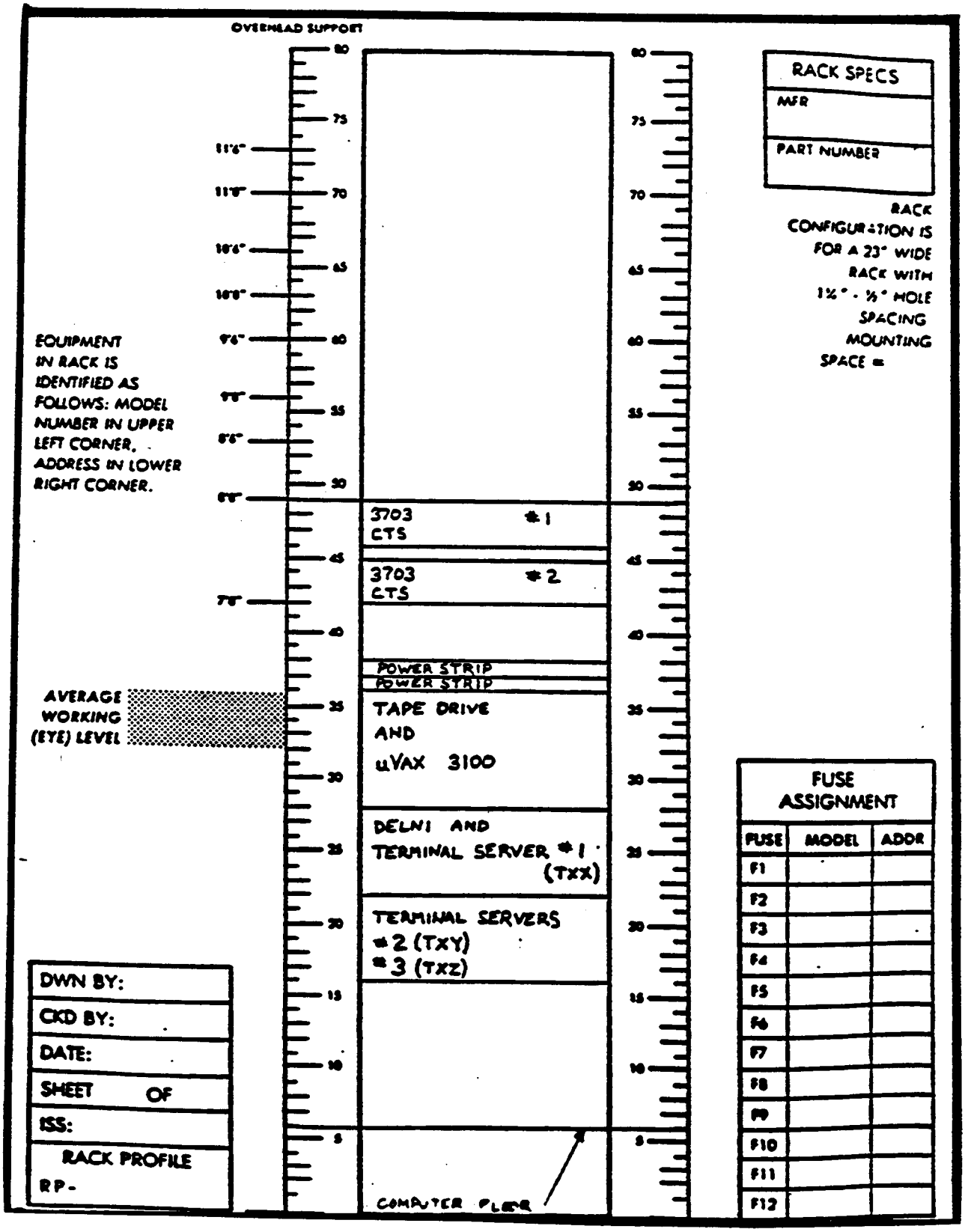
FIGURE 5-1. ALTE BLOCK DIAGRAM



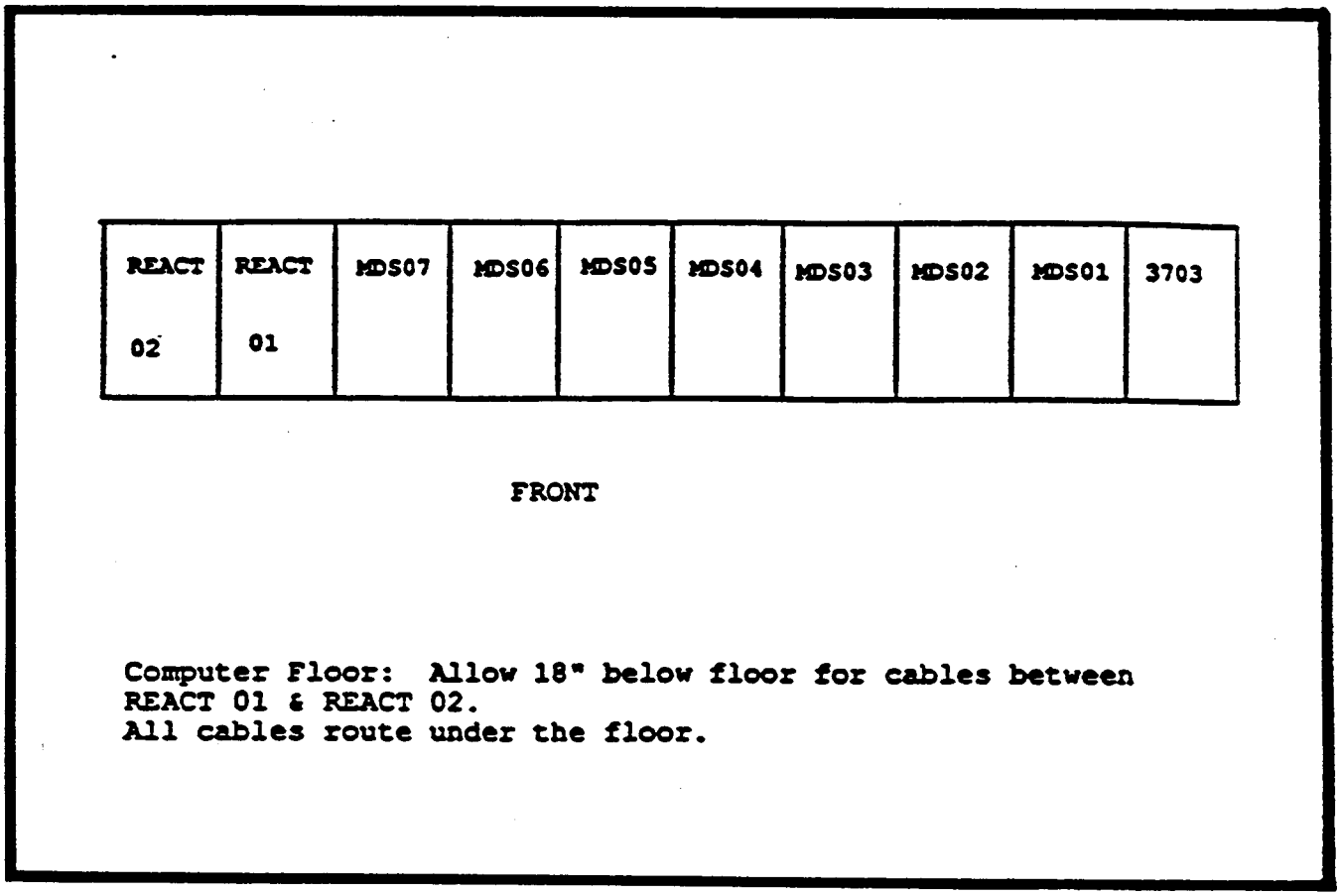
APPENDIX 6. EQUIPMENT RACK PROFILE



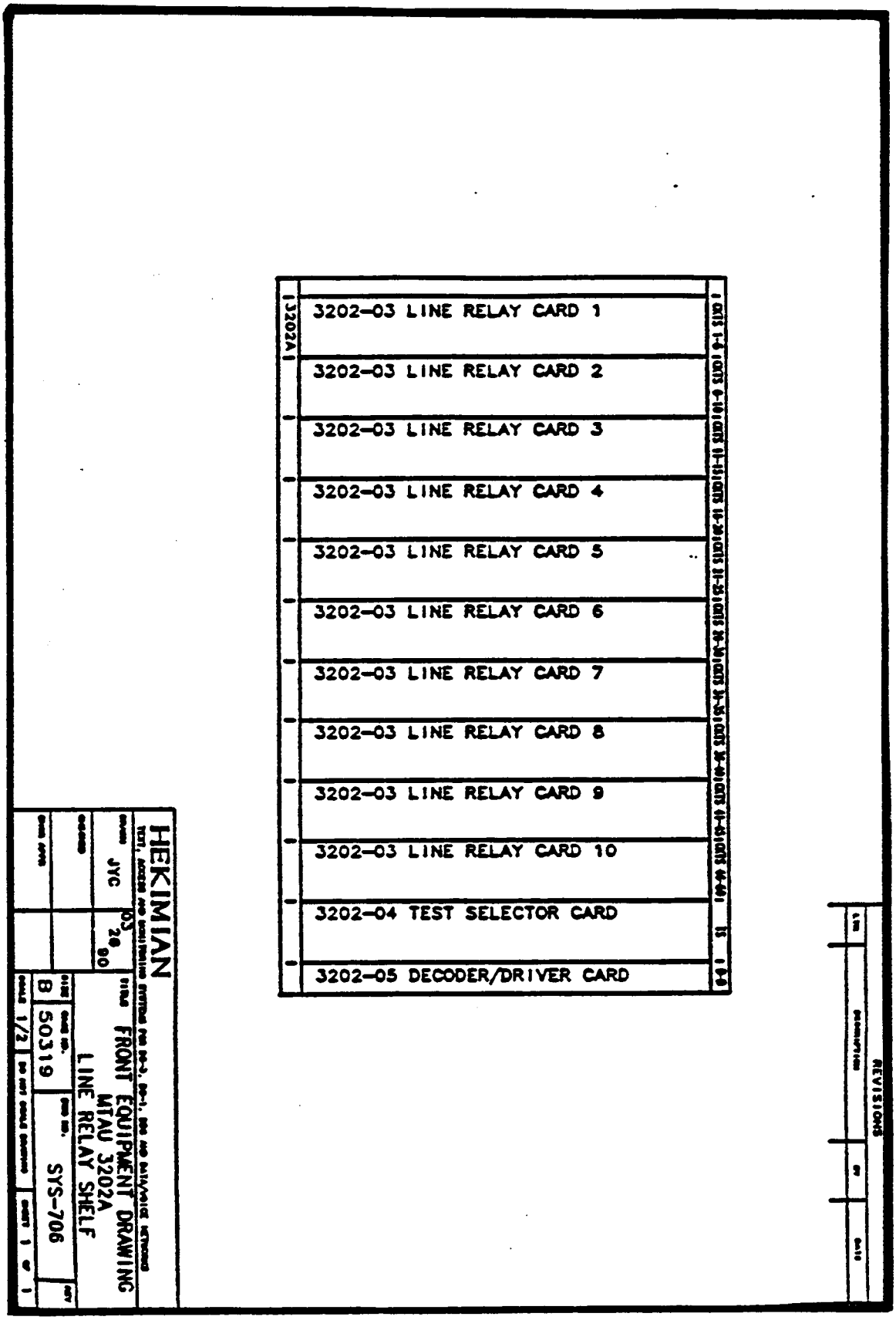
APPENDIX 6. EQUIPMENT RACK PROFILE (CONTINUED)



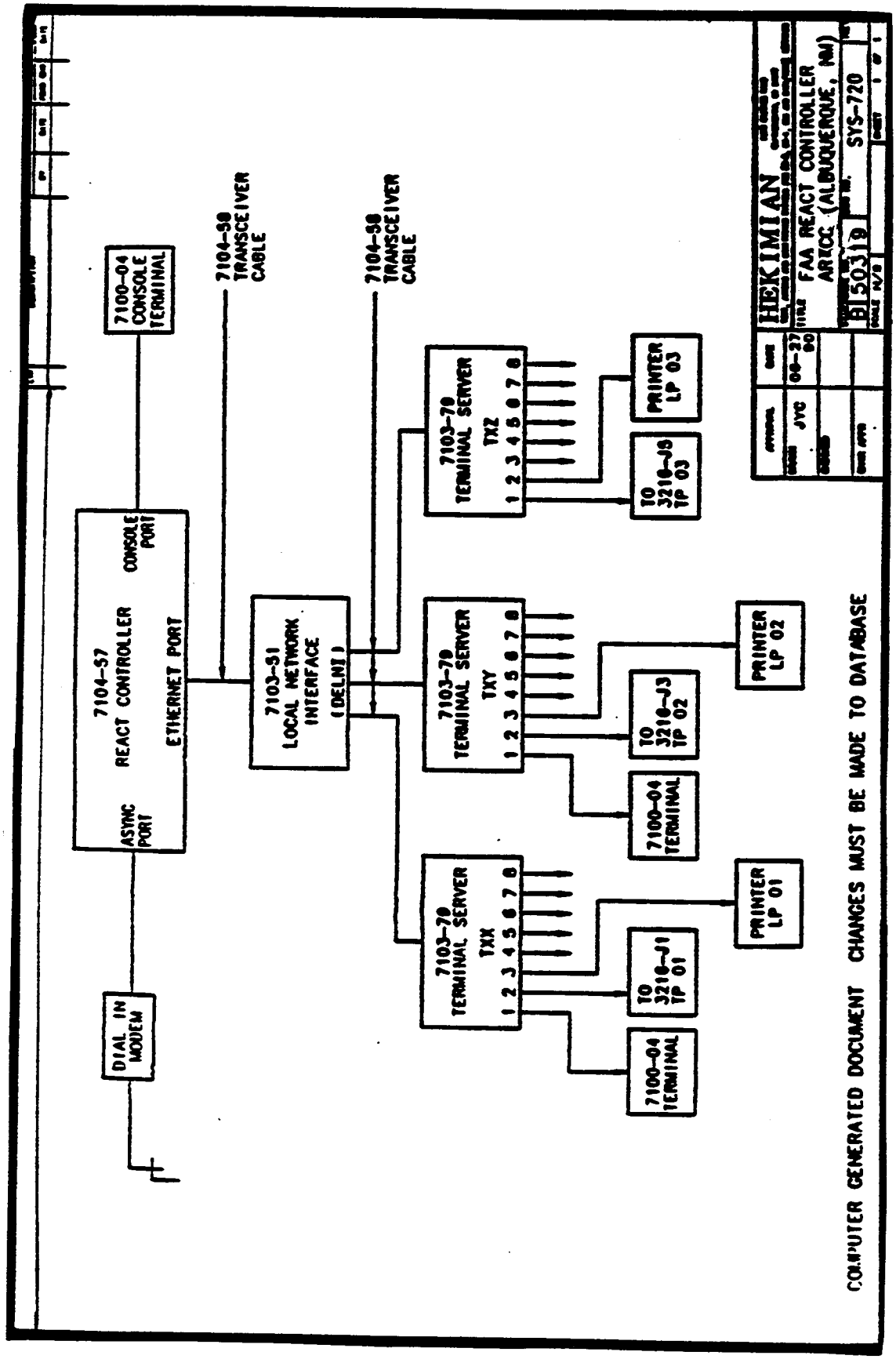
APPENDIX 6. EQUIPMENT RACK PROFILE - FRONT VIEW



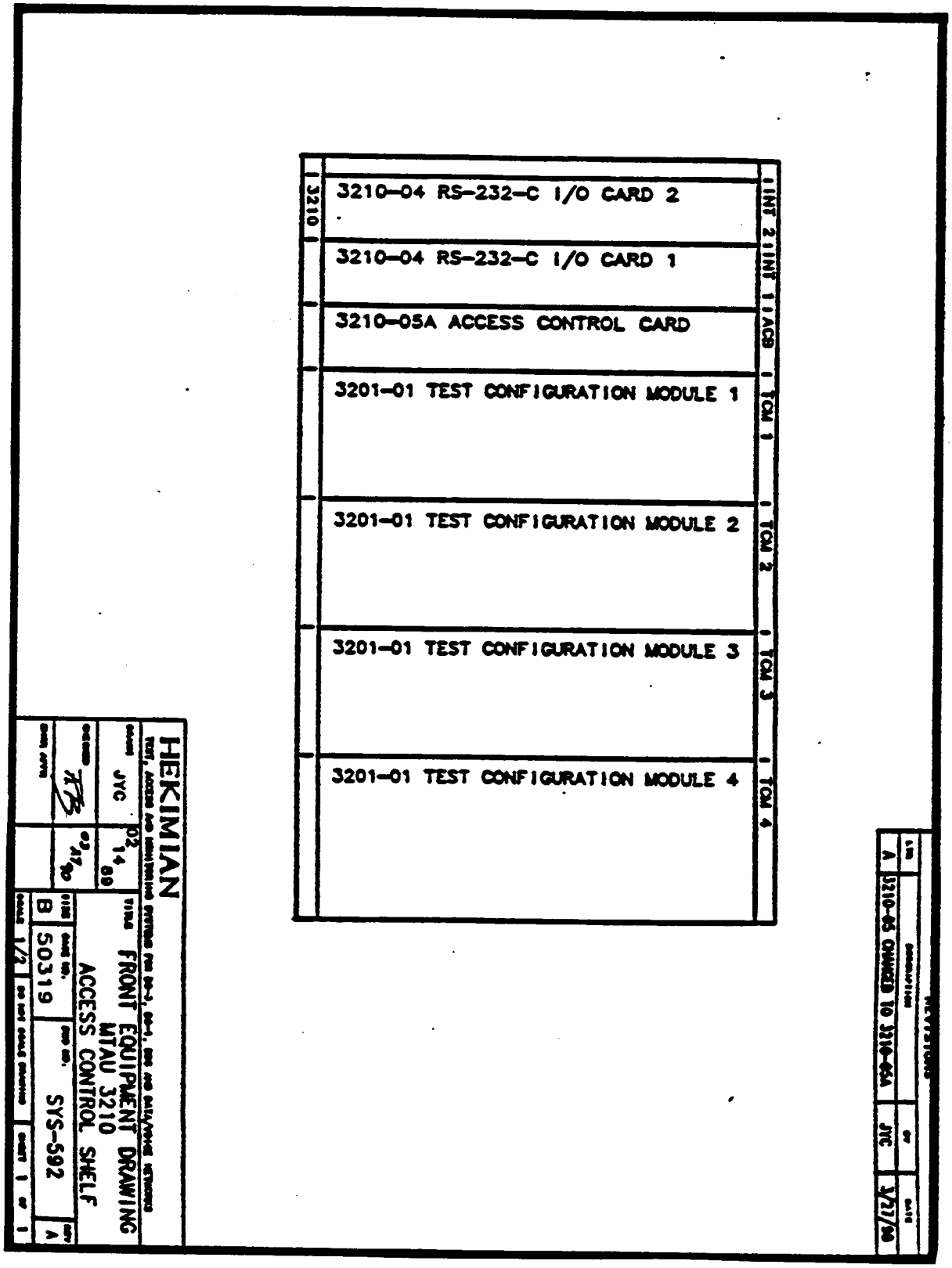
APPENDIX 6. EQUIPMENT RACK PROFILE - LINE RELAY SHELF



APPENDIX 6. EQUIPMENT RACK PROFIL - REACT CONTROLLER DRAWING



APPENDIX 6. EQUIPMENT RACK PROFILE - ACCESS CONTROL SHELF



APPENDIX 6. EQUIPMENT RACK PROFILE - MTAU SYSTEM DIAGRAM